PB80-177546

Command Procedures for Manipulating Tape Data Files: A Set of Procedures Developed for Use With the COMNET ALPHA Time-Sharing System

(U.S.) Environmental Monitoring Systems Lab.
Las Vegas, NV

Mar 80

U.S. Department of Commerce
National Technical Information Service
NTIS

United States
Environmental Protection
Agency

Environmental Monitoring
Systems Laboratory
P.O. Box 15027
Las Vegas NV 89114

EPA-600/8-80-013
March 1980

PB80-177541

Research and Development

EPA

Command Procedures for Manipulating Tape Data Files:

A Set of Procedures Developed for Use With the Comnet Alpha Time-Sharing System

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA 22161

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-600/8-80-013	2.
3. RECIPIENT'S ACCESSION NO. PB80 177546	
4. TITLE AND SUBTITLE COMMAND PROCEDURES FOR MANIPULATING TAPE DATA FILES: A Set of Procedures Developed for Use with the COMNET ALPHA Time Sharing System.	5. REPORT DATE March 1980
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) R. A. McCrory and L. R. Williams	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Environmental Monitoring Systems Laboratory Office of Research and Development U.S. Environmental Protection Agency Las Vegas, NV 89114	10. PROGRAM ELEMENT NO. 1BD884
	11. CONTRACT/GRANT NO.
12. SPONSORING AGENCY NAME AND ADDRESS U.S. Environmental Protection Agency--Las Vegas, NV Office of Research and Development Environmental Monitoring and Support Laboratory Las Vegas, Nevada 89114	13. TYPE OF REPORT AND PERIOD COVERED Final Report 6/78 - 3/79
	14. SPONSORING AGENCY CODE EPA/600/07

15. SUPPLEMENTARY NOTES
NTIS-Only distribution

16. ABSTRACT

The problem addressed by this report is the lack of simple terminal commands to manipulate tape data files at the U.S. Environmental Protection Agency's Washington Computer Center. This work was performed to enable relatively inexperienced programmers or scientists to maintain large infrequently used data sets on magnetic tape. The report documents a set of terminal command language procedures which greatly simplify the maintenance of data files on magnetic tape. The command procedures are invoked by entering a single word at the computer terminal. The computer queries the user for specific information and then submits a job to accomplish the actual data transfer. Ancillary procedures are included to facilitate the housekeeping requirements of tape management. The storage of large infrequently-used data sets on magnetic tape saves ADP funds and frees system resources for other applications. Such savings lessen capital investment requirements as the Agency's ADP needs expand. We have cut our group's monthly disk storage charges by 50% using these procedures.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
data storage executive routines magnetic tapes utility routine	U.S. EPA Washington Computer Center, tape file management, ALPHA, command language procedures	09/B

18. DISTRIBUTION STATEMENT RELEASE TO PUBLIC	19. SECURITY CLASS *(This Report)* UNCLASSIFIED	21. NO. OF PAGES
	20. SECURITY CLASS *(This page)* UNCLASSIFIED	22. PRICE

EPA Form 2220-1 (9-73)

EPA-600/8-80-013
March 1980

COMMAND PROCEDURES FOR MANIPULATING TAPE DATA FILES: A Set of Procedures Developed for Use with the COMNET ALPHA Time Sharing System

by

R. A. McCrory

Computer Sciences Corporation
P. O. Box 15027
Las Vegas, Nevada 89114

and

L. R. Williams

Environmental Monitoring Systems Laboratory
Las Vegas, Nevada 89114

ENVIRONMENTAL MONITORING SYSTEMS LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
LAS VEGAS, NEVADA 89114

DISCLAIMER

This report has been reviewed by the Environmental Monitoring Systems Laboratory-Las Vegas, U.S. Environmental Protection Agency, and approved for publication. Mention of trade names or commerical products does not constitute endorsement or recommendation for use.

FOREWORD

Protection of the environment requires effective regulatory actions based on sound technical and scientific information. This information must include the quantitative description and linking of pollutant sources, transport mechanisms, interactions, and resulting effects on man and his environment. Because of the complexities involved, assessment of specific pollutants in the environment requires a total systems approach that transcends the media of air, water, and land. The Environmental Monitoring Systems Laboratory-Las Vegas contributes to the formation and enhancement of a sound monitoring data base for exposure assessment through programs designed to:

- develop and optimize systems and strategies for monitoring pollutants and their impact on the environment
- demonstrate new monitoring systems and technologies by applying them to fulfill special monitoring needs of the Agency's operating programs

The storage, access, and manipulation of large environmental quality data files on magnetic tape at the U.S. Environmental Protection Agency's Washington Computer Center have posed special problems to Agency programmers and scientists. To aid organizational units in realizing the potential cost-savings associated with tape storage, this report presents a set of simple terminal commands to facilitate the manipulation and integration of large data sets on magnetic tape. By removing the obstacles to dynamic utilization of tape storage, the information provided should stimulate increased use of this economical storage mode and thereby effect significant cost reductions both within and outside the agency. For further information contact the Advanced Monitoring Systems Division.

George B. Morgan
Director
Environmental Monitoring Systems Laboratory
Las Vegas

SUMMARY

The problem addressed by this report is the lack of simple terminal commands to manipulate tape data files at the U.S. Environmental Protection Agency's Washington Computer Center. This work was performed to enable relatively inexperienced programmers or scientists to maintain large infrequently used data sets on magnetic tape. The report documents a set of terminal command language procedures which greatly simplify the maintenance of data files on magnetic tape. The command procedures are invoked by entering a single word at the computer terminal. The computer queries the user for specific information and then submits a job to accomplish the actual data transfer. Ancillary procedures are included to facilitate the housekeeping requirements of tape management. The storage of large infrequently used data sets on magnetic tape saves ADP funds and frees system resources for other applications. Such savings lessen capital investment requirements as the Agency's ADP needs expand. We have cut its monthly disk storage charges by 50% using these procedures. We feel that the procedures presented will both facilitate the manipulation and integration of large data sets on magnetic tape and result in substantial cost reductions for workers in many fields both within and outside the Agency.

CONTENTS

Foreword iii
Summary iv
List of Figures vi
Introduction 1
Procedures 2

DTOTAPE 2
TTODISK 5
CATAPE 8
CATALOG 10
UNCATAPE 12
DELTAPE 14
SPACEL 16
TAPELIST 18

Considerations for using tape files 20
Discussion 21
References 23

FIGURES

Number		Page
1	Terminal listing and example of the procedure DTOTAPE which reproduces a disk file on magnetic tape	3
2	Terminal listing and example of the procedure TTODISK which reproduces a tape file onto a disk pack	6
3	Terminal listing and example of the procedure CATAPE which catalogs a tape file	9
4	Terminal listing and example of the procedure CATALOG which catalogs a disk file	11
5	Terminal listing and example of the procedure UNCATAPE which uncatalogs and optionally deletes a tape file	13
6	Terminal listing and example of the procedure DELTAPE which deletes uncataloged tape files	15
7	Terminal listing and example of the procedure SPACEL which lists the unused space remaining on a disk pack	17
8	Terminal listing and example of the Job Control Language file TAPELIST which generates a listing of tape data sets	19

INTRODUCTION

The use and maintenance of tape files at the U.S. Environmental Protection Agency's Washington Computer Center (WCC-COMNET) is not as easy as it is for disk files. Disk files can be created, destroyed, edited, replaced, and inventoried using simple terminal commands. The purpose of this report is to describe ALPHA command language "procedures" which enable relatively casual or inexperienced programmers to use tape files at COMNET.

The principal reason for using tape storage is pecuniary. The cost of maintaining large disk files at COMNET is significant and real savings can be realized by transferring infrequently used disk files to tape.

The procedures have been written in the ALPHA command language which is fully described in the ALPHA User's Guide (1977). To transfer these procedures to another USERID (ALPHA terminal user) the programmer loads them individually from the EPABZF source library as:

```
LOAD DTOTAPE:EPABZF;SAVE
```

and then saves them with the SAVE command into his own source library. Note that the procedure DTOTAPE uses a JCL file named TTAPE which must also be loaded and saved into the user's source library.

These procedures submit jobs which must then be executed before the desired transfer or action is accomplished and the job's JCL (job control language) and system messages must be examined afterwards to confirm that the expected result has occurred.

The figures in this report are facsimiles of actual terminal output. The capital letters are those sent to the terminal from the computer while the small letters represent information typed at the terminal by the user. Also note that the procedure can be aborted at any point by depressing the break/attention key on the terminal keyboard.

PROCEDURES

DTOTAPE

Figure 1 shows a terminal listing of the procedure DTOTAPE and the JCL file, TTAPE, which DTOTAPE modifies before submitting it as a job. The last portion of Figure 1 shows an example of the actual use of the procedure and the squared numbers beside some of the lines correspond to the numbers contained in the following notes:

1. To execute the procedure, type "dtotape" followed by a carriage return.

2. This message identifies the procedure.

3. At this place input the name of the file to be written on tape.

4. At this place enter the name of the file to be reproduced.

5. A response of "yes" will uncatalog the old file, "no" or any other response will not.

6. This number should be the same as the LRECL (logical record length) of the disk file. If this is unknown then stop the procedure (hitting the break/attention key) and describe the disk file with "options=attributes" and then start over.

7. Hit the "carriage return" key, <CR>, to place the file on a new (scratch) tape. This allows you to specify the retention period (the time that the tape volume will be reserved for your use in the WCC Tape Library) and avoids possible problems associated with keeping more than one file on a tape volume.

8. This number can have 1 to 4 digits. Estimate the time necessary to retain this file but don't overestimate. You can change the expiration date at some later time by filling out the tape expiration form which is mailed to the project supervisor periodically and returning it to the tape librarian at the WCC.

9. Enter the priority that you want for the job this procedure submits. The priorities are 1 (overnight), 2 (4 hours), 3 (2 hours), and 4 (30 minutes).

```
     lis dtotape
100       SET @TERMOUT='THIS PROC SUBMITS A JOB TO COPY A DISK FILE TO TAPE
200       AND CATLG IT'·LOA TTAPE·DEC ULX
400       REP /XNAME/./CN.%@USERID..%@ACCOUNT.%@TERMIN('NAME FOR TAPE FILE
500       REP /XIN/,/CN.%@USERID..%@ACCOUNT.%@TERMIN('DISK FILE TO BE COPIED
510       IF @TERMIN('UNCATALOG THE OLD FILE ?')><'YES',C='GOTO 600'
520       REP /KEEP/ /UNCATLG/,360
600       REP /=80/,/=%@TERMIN('LRECL ?')./,600
710       SET ULX=@TERMIN('VOLUME AS OS9874 OR <CR> IF WANT SCRATCH TAPE')
720       IF @LENGTH(ULX)<6,C='GOTO 790'
730       REP /)/./),VOL=SER=%ULX./,700
740       REP /(,SL.RETPD=365)/,/%@TERMIN('FILE NUMBER ?')./
750       REP /NEW/,/OLD/.500·GOTO 800
790       REP /365/./%@TERMIN('4 DIGIT RETENTION PERIOD ?')./,700
800       LIS;SUB *,PRTY=%@TERMIN('PRIORITY FOR JOB ?').,TIME=(.5)

ALPH lis ttape
100       //DTOTAPE EXEC  PGM=IEBGENER.REGION=80K
200       //SYSPRINT  DD  SYSOUT=P.DCB=(RECFM=FB,LRECL=121,BLKSIZE=3630)
300       //SYSIN  DD  DUMMY
350       //SYSUT1  DD  DSN=XIN,
360       //     DISP=(OLD.KEEP)
400       //SYSUT2  DD  DSN=XNAME,
500       //  UNIT=3400-5,DISP=(NEW,CATLG),
600       //  DCB=(LRECL=80.RECFM=FB.BLKSIZE=8000.DSORG=PS),
700       //  LABEL=(,SL.RETPD=365)

ALPH dtotape[1]
THIS PROC SUBMITS A JOB TO COPY A DISK FILE TO TAPE AND CATLG IT[2]
NAME FOR TAPE FILE ?.new.data[3]
DISK FILE TO BE COPIED ?.p73.test[4]
UNCATALOG THE OLD FILE ?yes[5]
LRECL ?133[6]
VOLUME AS OS9874 OR <CR> IF WANT SCRATCH TAPE[7]
4 DIGIT RETENTION PERIOD ?365[8]
PRIORITY FOR JOB ?1[9]
100       //DTOTAPE EXEC  PGM=IEBGENER,REGION=80K
200       //SYSPRINT  DD  SYSOUT=P,DCB=(RECFM=FB,LRECL=121,BLKSIZE=3630)
300       //SYSIN  DD  DUMMY
350       //SYSUT1  DD  DSN=CN.EPABZF.XXXX.P73.TEST,
360       //     DISP=(OLD,UNCATLG)
400       //SYSUT2  DD  DSN=CN.EPABZF.XXXX.NEW.DATA,
500       //  UNIT=3400-5,DISP=(NEW,CATLG),
600       //  DCB=(LRECL=133,RECFM=FB.BLKSIZE=13300,DSORG=PS),
700       //  LABEL=(,SL,RETPD=365)
199  WH SUBMITTED[11]
```

Figure 1. Terminal listing and example of the procedure DTOTAPE which reproduces a disk file on magnetic tape.

10. This is a listing of the modified JCL file which the procedure submits as a job. It is located in your workspace if you want to keep it or use it after the procedure finishes.

11. This is the ALPHA message indicating the JOBID of the submitted job.

12. The return of your ALPHA prompt ("ALPHA" here) indicates that the procedure is finished.

This procedure is stored in the ALPHA source library named CL.SLIB.EPABZF as member "dtotape" and uses the JCL DECK "ttape" in the same library.

DTOTAPE can be used to transfer data files to tape while keeping the same name in the system catalog. To accomplish this use the same name for the new tape file as for the disk file to be copied and uncatalog the old file. When you are sure that the file has been successfully transferred to the tape volume you can purge the disk file with the ALPHA command:

```
PURGE .DATA.SET"USER69
```

using whatever volume is applicable.

The ALPHA edit commands cannot be used to modify tape files. To update a tape file with the ALPHA commands the file must be transferred to a disk. The next procedure, TTODISK, can be used for this purpose.

TTODISK

Figure 2 shows a terminal listing of the procedure TTODISK and the JCL file, DDISK, which the procedure modifies before submitting as a job. Prior to invoking this procedure the user should use the SPACEL procedure on page 16 or the ALPHA DESCRIBE command to find a user disk pack with sufficient space to store the tape file. This information is required when the procedure queries the use for the volume (see note 9). The last portion of Figure 2 shows an example of the actual use of the procedure. The squared numbers beside some of the lines correspond to the numbers contained in the following notes:

1. To invoke the procedure, type "ttodisk" at the terminal.

2. This message identifies the procedure.

3. Enter the name of the tape file to be reproduced on the disk.

4. If the tape file is cataloged hit the carriage return key, otherwise type in the volume on which the file is located. To find out if the file is cataloged, use the ALPHA describe command. If it is not cataloged submit the TAPELIST program, described elsewhere in this report, to obtain a listing of volumes for your tape files.

5. Type "yes" to uncatalog the tape file, or any other response for no.

6. Enter a valid name. If desired you can check the validity of the name by loading a dummy file (any file) into your workspace and saving it under the name. If it is accepted (ALPHA file "saved" message returned at your terminal), don't forget to purge it before using this procedure.

7. Enter the LRECL (logical record length) of the input (tape) file.

8. The block size (BLKSIZE) must be less than 4253, but as large as possible to minimize transfer cost.

9. Enter the disk volume. If you put the file on a work pack it will not be backed up and you could lose it. So use the SPACEL procedure, described on page 16, to locate a user volume with enough space.

10. Enter a rough estimate of the space needed to store the file.

```
ALPH lis ttodisk
100       SET @TERMOUT='PROC TO COPY TAPE FILE TO DISK':LOA DDISK·DEC UX
300       REP /XIN/,/CN.%@USERID..%@ACCOUNT.%@TERMIN('TAPE FILE TO BE COPIED AS .+
500       DATA ?').:SET UX=@TERMIN('IF TAPE FILE NOT CATALOGED. GIVE VOLUME ')
700       IF @LENGTH(UX)<6.C='GOTO 800':REP /EEP)/,/EEP).VOL=SER=%UX.,UNIT=3400-5/
710       GOTO 850
800       IF @TERMIN('UNCATALOG TAPE FILE ?')='YES',C='REP /KEEP/,/UNCATLG/.500'
850       REP /XNAME/,/CN.%@USERID..%@ACCOUNT.%@TERMIN('NAME FOR NEW DISK FILE. A+
900       S .NEW ?').·REP /LXL/,/%@TERMIN('LRECL ?')./
1100      REP /BXB/,/%@TERMIN('BLKSIZE ?')./:REP /VXV/,/%@TERMIN('VOLUME ?')./
1300      REP /TXT/./%@TERMIN('NUMBER OF TRACKS ?')./
1400      LIS:SUB *,PRTY=%@TERMIN('PRIORITY FOR JOB ?')..TIME=(.5)

ALPH lis ddisk
100       //TTODISK EXEC PGM=IEBGENER.REGION=80K
200       //SYSPRINT DD SYSOUT=P.DCB=(RECFM=FB,LRECL=121.BLKSIZE=3630)
300       //SYSIN DD DUMMY
400       //SYSUT1 DD DSN=XIN,
500       //    DISP=(OLD.KEEP)
600       //SYSUT2 DD DSN=XNAME,
700       //   UNIT=3330-1,DISP=(NEW.CATLG,DELETE),SPACE=(TRK.(TXT.TXT),RLSE),
800       //   DCB=(RECFM=FB.LRECL=LXL.BLKSIZE=BXB).VOL=SER=VXV

ALPH ttodisk[1]
PROC TO COPY TAPE FILE TO DISK[2]
TAPE FILE TO BE COPIED AS .DATA ?.old.data[3]
IF TAPE FILE NOT CATALOGED. GIVE VOLUME[4]
UNCATALOG TAPE FILE ?yes[5]
NAME FOR NEW DISK FILE. AS .NEW ?.new.data[6]
LRECL ?133[7]
BLKSIZE ?4123[8]
VOLUME ?user56[9]
NUMBER OF TRACKS ?3[10]
PRIORITY FOR JOB ?1[11]
100       //TTODISK EXEC PGM=IEBGENER,REGION=80K
200       //SYSPRINT DD SYSOUT=P,DCB=(RECFM=FB,LRECL=121.BLKSIZE=3630)
300       //SYSIN DD DUMMY
400       //SYSUT1 DD DSN=CN.EPABZF.XXXX.OLD.DATA,
500       //    DISP=(OLD,UNCATLG)                                    [12]
600       //SYSUT2 DD DSN=CN.EPABZF.XXXX.NEW.DATA.
700       //   UNIT=3330-1.DISP=(NEW,CATLG DELETE).SPACE=(TRK.(3,3).RLSE).
800       //   DCB=(RECFM=FB,LRECL=133,BLKSIZE=4123).VOL=SER=USER56
199  WJ SUBMITTED[13]
```

Figure 2. Terminal listing and example of the procedure TTODISK which reproduces a tape file onto a disk pack.

11. Enter the job priority, 1 to 4;

    1 overnight turnaround
    2 4 hour turnaround
    3 2 hour turnaround
    4 30 minute turnaround

12. This is a listing of the JCL which is submitted by the procedure.

13. This is the ALPHA job message. To verify that the job is in the queue use the "status all" command.

TTODISK can be used to move a cataloged file from tape to disk, keeping the same file name in the system catalog. Use the same name for the new disk file as for the tape file to be copied and uncatalog the tape file by answering 'yes' to the question at step (5). After the program is run, check that the new file has been successfully copied and cataloged and then, unless you want to keep it as a backup copy, delete the uncataloged tape copy with DELTAPE.

CATAPE

Figure 3 shows a terminal listing of the CATAPE procedure and the JCL file CTAPE which the procedure modifies and submits as a job. The last part of Figure 3 shows an example of the operation of the procedure. The squared numbers to the right of some of the print lines correspond to the following notes:

1. To execute the procedure type "catape" followed by a carriage return.
2. This is a message which identifies the procedure.
3. Enter here the name of the existing tape file which is to be cataloged.
4. Enter the volume that contains the file. If this is not known it can be obtained by running the TAPELIST JCL described later (page 18).
5. Enter the desired priority for the job.
6. This is a listing of the JCL deck which the procedure submits.
7. The ALPHA "submitted" message shows that the job has been queued.

```
ALPH lis catape
100       LOA CTAPE:SET @TERMOUT='PROC TO CATALOG A TAPE FILE'
200       REP /FILENAME/,/CN.%@USERID..%@ACCOUNT.%@TERMIN('FILE NAME ?')./
300       REP /OSXXXX/,/%@TERMIN('VOLUME AS OS4994 ?')./
400       LIS·SUB *,PRTY=%@TERMIN('PRIORITY FOR JOB ?').,TIME=(.1)

ALPH lis ctape
100       //TAPECAT  EXEC  PGM=IEFBR14
200       //FILE1 DD DSN=FILENAME.
300       //    DISP=(OLD.CATLG).UNIT=(3400-5 ,DEFER),VOL=SER=OSXXXX.
400       //    DCB=(DEN=4)

ALPH catape [1]
PROC TO CATALOG A TAPE FILE [2]
FILE NAME ?.new.test.data [3]
VOLUME AS OS4994 ?os9987    [4]
PRIORITY FOR JOB ?1 [5]
100       //TAPECAT  EXEC  PGM=IEFBR14                                    [6]
200       //FILE1 DD DSN=CN.EPABZF.XXXX.NEW.TEST.DATA,
300       //    DISP=(OLD.CATLG).UNIT=(3400-5,,DEFER),VOL=SER=OS9987,
400       //    DCB=(DEN=4)
199: WL SUBMITTED [7]
```

Figure 3. Terminal listing and example of the procedure CATAPE which catalogs a tape file.

CATALOG

This procedure catalogs an existing disk file using the ALPHA "rename" command. It does not submit a job but operates immediately. Figure 4 shows a listing of the procedure and an actual example of its use. The squared numbers to the right of some lines in the figure correspond to the following comments:

1. To use the procedure, type "catalog" followed by a carriage return.

2. This message identifies the procedure.

3. Enter the file name to be cataloged.

4. Enter the disk pack on which the file resides.

5. These two lines are the normal ALPHA response to this procedure.

You can now use the ALPHA "describe" command to check that the file is cataloged.

```
ALPH lis catalog
100       DEC DSNA:SET @TERMOUT='PROC TO CATALOG DISK FILES'
200       SET DSNA=@TERMIN('.DSNAME TO BE CATALOGED ?')
300       REN %DSNA."%@TERMIN('VOLUME ?')..%DSNA.

ALPH catalog [1]
PROC TO CATALOG DISK FILES [2]
.DSNAME TO BE CATALOGED ?.new.test.data [3]
VOLUME ?work51 [4]
REN .NEW.TEST.DATA"WORK51..NEW.TEST.DATA
056: DATA SET ALREADY EXISTS ON VOLUME [5]
```

Figure 4. Terminal listing and example of the procedure CATALOG which catalogs a disk file.

UNCATAPE

This procedure uncatalogs (and deletes optionally) a cataloged tape file. Figure 5 shows a listing of the procedure and the JCL file THEUNCAT which the procedure modifies and submits as a job. The last portion of Figure 5 demonstrates the actual use of the procedure. The squared numbers to the right of some of the lines correspond to those in the following notes:

1. Type "uncatape" followed by a carriage return to invoke the procedure.

2. This message identifies the procedure.

3. Enter the file name which is to be uncataloged.

4. Enter "yes" if you have more files to uncatalog.

5. Another file name to be uncataloged.

6. Type "no" followed by a carriage return or just a carriage return when all files have been entered.

7. Enter "yes" followed by a carriage return or any other response followed by a carriage return for no.

8. Enter priority for job.

9. This is the ALPHA-job-submitted message indicating the job identification.

10. This is a listing of the contents of the workspace showing the JCL deck submitted by the procedure.

```
ALPH lis uncatape
100       SET @TERMOUT='PROC TO UNCATALOG & OPT. DELETE TAPE FILES'
200       DEC J·SET J=1·LOA THEUNCAT(100-300)
300       REP /XNAME/,/CN.%@USERID..%@ACCOUNT.%@TERMIN('FILE NAME AS .DATA ?')./
400       IF '%@TERMIN('MORE FILES ?').'><'YES',C='GOTO 1000'
500       APP THEUNCAT(200-300)·SET J=J+1;REP /DD1/./DD%J./.300-LAS:GOTO 300
1000      APP THEUNCAT(400):REP /3330-1/ /3400-5/
1200      IF '%@TERMIN('DELETE ALSO ?').'><'YES',C='GOTO 2200'
1300      REP /UNCATLG/./DELETE/
2200      SUB *,PRTY=%@TERMIN('PRIORITY FOR JOB ?').,TIME=(.2)·LIS

ALPH lis theuncat
100       //THEUNCAT  EXEC  PGM=IEFBR14
200       //DD1       DD    DSN=XNAME,
300       //        DISP=(OLD,UNCATLG),UNIT=(3330-1,,DEFER)
400       /*

ALPH uncatape [1]
PROC TO UNCATALOG & OPT. DELETE TAPE FILES [2]
FILE NAME AS .DATA ?.new.test.data [3]
MORE FILES ?yes [4]
FILE NAME AS .DATA ?.old.test.data [5]
MORE FILES ?no [6]
DELETE ALSO ?yes [7]
PRIORITY FOR JOB ?1 [8]
199  WM SUBMITTED [9]
100       //THEUNCAT  EXEC  PGM=IEFBR14
200       //DD1       DD    DSN=CN.EPABZF.XXXX.NEW.TEST.DATA,
300       //        DISP=(OLD,DELETE),UNIT=(3400-5,,DEFER)
400       //DD1       DD    DSN=CN.EPABZF.XXXX.OLD.TEST.DATA,        [10]
500       //        DISP=(OLD,DELETE),UNIT=(3400-5,,DEFER)
600       /*
```

Figure 5. Terminal listing and example of the procedure UNCATAPE which uncatalogs and optionally deletes a tape file.

DELTAPE

This procedure deletes an uncataloged tape file. It is used only to delete uncataloged files. Use UNCATAPE to delete cataloged tape files; otherwise the catalog reference remains in the system catalog even though the file has been purged. Figure 6 shows a terminal listing of DELTAPE together with file THEUNCAT, the JCL file that the procedure modifies and submits as a job. The last portion of Figure 6 is an actual example of the use of this procedure. The squared numbers to the right of some lines correspond to those following:

1. Enter "deltape" to start the procedure.

2. This message identifies the procedure.

3. Enter the name of the tape file to be deleted.

4. Type "yes" to enter another file name or any other response for no.

5. Enter the volume where the file resides. This information can be obtained from an output listing generated by running the TAPELIST JCL file described later.

6. Enter the job priority.

7. The ALPHA job submit may come either before or after the JCL listing.

8. This is the listing of the JCL deck submitted by the procedure.

```
ALPH lis deltape
100       SET @TERMOUT='PROC TO DELETE UNCATALOGED TAPE FILES'
200       DEC J:SET J=J+1:LOA THEUNCAT(100-300)
300       REP /XNAME/./CN.%@USERID..%@ACCOUNT.%@TERMIN('FILE NAME AS .DATA ?')./
400       IF '%@TERMIN('MORE FILES ?').'><'YES',C='GOTO 1000'
700       APP THEUNCAT(200-300):SET J=J+1 REP /DD1/./DD%J./.300-LAS:GOTO 300
1000      APP THEUNCAT(400):REP /3330-1/ /3400-5/
1200      REP /DEFER)/. /DEFER).VOL=SER=%@TERMIN('VOLUME AS OS4994 ?')./
1300      REP /UNCATLG/./DELETE/
2200      SUB *.PRTY=%@TERMIN('PRIORITY FOR JOB ?'). TIME=(.2);LIS

ALPH lis theuncat
100       //THEUNCAT  EXEC  PGM=IEFBR14
200       //DD1       DD    DSN=XNAME,
300       //        DISP=(OLD,UNCATLG) UNIT=(3330-1,,DEFER)
400       /*

ALPH deltape [1]
PROC TO DELETE UNCATALOGED TAPE FILES [2]
FILE NAME AS .DATA ?.old.data [3]
MORE FILES ?no [4]
VOLUME AS OS4994 ?os5678 [5]
PRIORITY FOR JOB ?1 [6]
199  UN SUBMITTED [7]
100       //THEUNCAT  EXEC  PGM=IEFBR14                                    [8]
200       //DD1       DD    DSN=CN.EPADZF.XXXX.OLD.DATA.
300       //        DISP=(OLD,DELETE),UNIT=(3400-5,,DEFER),VOL=SER=OS5678
400       /*
```

Figure 6. Terminal listing and example of the procedure DELTAPE which deletes uncataloged tape files.

SPACEL

This procedure, written by COMNET USER SUPPORT (HELPWC), is used to find space on a disk pack in order to place a file on a USER pack as opposed to a work pack. The work disk packs are not back-up so any files on them are lost if the disk or system malfunctions. Direct Access (DSORG=DA) data sets, as opposed to Sequential (DSORG=PS) data sets, are not automatically moved to the USER packs by the ALPHA disk-management utilities.

Figure 7 shows a listing of SPACEL and an example of its output. The squared numbers on the Figure correspond to the following comments:

1. Type "spacel" to start the procedure.

2. This is the terminal output of this procedure with the remainder of the cut-off lines underneath.

3. The remainder.

```
ALPH lis spacel
100       DEC PACKID
200       LIS DS.HELPWC.SPACE((FIR)),O=NOS
300       SET @TERMOUT=''
400       SET @TERMOUT='CURRENT DATE AND TIME:'
500       TIME J
600       SET @TERMOUT='(%@DATE)'
700       SET @TERMOUT=''
800       SET PACKID=@TERMIN('ENTER PACK PREFIX : ')
900       IF @LENGTH(PACKID)=0,C=EXIT
1000      LIS DS.HELPWC.SPACE(-%PACKID-)
1100      GOTO 700

ALPH spacel[1]


          REPORT ON WCC ONLINE DISKS AS OF 15.10.56 ON 79/017

CURRENT DATE AND TIME:
15.43:52. 79.017
(01/17/79)

ENTER PACK PREFIX : user67
          USER67    3330-11     FREE SPACE    0137 CYLS AND 0049 TRKS IN 0005 EXT

ENTER PACK PREFIX : [2]

ALPH



             - LARGEST EXTENT IS 0089 CYLS AND 0011 TRKS [3]
```

Figure 7. Terminal listing and example of the procedure SPACEL which lists the unused space remaining on a disk pack.

TAPELIST

This is a job control language (JCL) deck which outputs a list of tape data sets for the user's initials and account. The output includes both cataloged and uncataloged files. Figure 8 shows the listing of TAPELIST followed by a listing of the output file for user EPABZF. The listing includes the volume name and expiration date for each file.

```
ALPH lis tapelist
100       //* TO GENERATE A LISTING OF TAPE DATA SETS
200       //TAPEWORM  EXEC  TAPELIST.PRINT=P

ALPH nes
(14 05 42. 01/12/79)      RETRY ENABLED. ENTER ALARM TO STOP.
(14:06:38. 01/12/79) ZC STARTED    79.012 14:06:38
(14:07:40. 01/12/79) ZC ENDED      79.012 14:07:40
(14:07:57. 01/12/79) ZC OUTPUT     79.012 14:07:45
(17:49:08. 01/16/79) WE STARTED    79.016 17:49:08
(17:53:38. 01/16/79) WE ENDED      79.016 17:53:38
(17:54 41. 01/16/79) WE OUTPUT     79.016 17:54:41

ALPH ret we,s
Remote Output - EPABZFWE
*0 = System Messages
*1 = DSNLIST.SYSLST0
*2 = TAPELIST.SYSLST0

ALPH lis *2



          TAPELIST - Inventory of TMS-Controlled Tapes     79.016  01/16/79     05:52:39  E

          Volume  O w n i n g                Vol Fil
           Name  Userid Account              Seq Seq  D a t a s e t  N a m e

          OS2039 EPABZF XXXX                   1   1 CN.EPABZF.XXXX.STW.COND73.ONE
          OS2114 EPABZF XXXX                   1   1 CN.EPABZF.XXXX.STW.COND73.TWO


             M                                    Page      1

                                  Last Creating
                    Credt Expdt   Used   Job      Den Lbl

                   78207 80265 78207 EPABZF9K  6250  SL
                   78207 80265 78207 EPABZF9L  6250  SL
```

Figure 8. Terminal listing and example of the Job Control Language file TAPELIST which generates a listing of tape data sets.

CONSIDERATIONS FOR USING TAPE FILES

This section makes several general comments about the use of tape storage at the Washington Computer Center. The default message level (MSGLEVEL) at COMNET is (2,0) which prints only the JCL deck that was submitted with the job. Using a JOBPARM command statement is the ALPHA signon procedure (file $$SIGNON in your source library) with MSGLEVEL=(1,1) will enable the user to check the system messages file, labeled "*O" in the ALPHA job output (SYSOUT=P) file listing, and verify that the program has been successful. This or some other method should be used to check that the job has successfully transferred a file before the user purges the old file.

More than one file can be placed on a volume (tape reel). However this can lead to difficulty since any subsequent files on a tape are rendered inaccessible whenever a file is uncataloged or deleted. Also the expiration date of the first file on a tape applies to all files on that reel. Normal procedure at the Washington Computer Center (COMNET) seems to be to put only one file on a volume.

A formula for determining the length of tape necessary to store a file is found in Brown (1977). This might be useful if a file is to contain 100,000 or more records, although the "VOLUME" JCL parameter can be modified to use additional volumes (tape reels) if the transfer program runs out of space on the first volume.

Sources of additional information on magnetic tape usage are Brown (1977), and "ALPHA User's Guide" (1977). The WCC "SIGNON" publication, distributed monthly to registered users of the WCC facility, also contains useful information.

DISCUSSION

The set of command procedures (programs) described here enable the ALPHA terminal user to use magnetic digital computer tape as a storage medium without a detailed knowledge of tape conventions at the U.S. EPA Washington Computer Center. The procedures are used as terminal commands to copy disk data sets to tape, to copy data sets to disk, and to maintain and back up tape data files. These terminal commands ask the user for specific information, use this information to modify a short JCL file, and submit that JCL file as a computer job.

The use of tape to store large infrequently used data sets results in significant savings of ADP funds. A one-hundred track disk data set (15000 card images or 9000 print lines) currently costs $20 per month at COMNET. That disk data set can be transferred at nominal cost to tape for which there is no current monthly charge. The Water and Land Quality Branch has recently (May to September, 1978) used 4000 to 6000 tracks of disk storage with many files requiring 100 to 200 tracks. The data files for a single national water quality survey alone represent 75 thousand print lines of biological and 2.5 million physical and chemical water quality parameter data entries. Our average cost for disk storage for May to September 1978 was $1126. In November, after many of the large files had been put on tape, the corresponding figure was $439. The savings for the Water and Land Quality Branch are $400 to $600 per month or roughly 10% of our current COMNET ADP charges. Other EPA entities should be able to effect similar savings if they maintain large infrequently-used data sets on disk.

The advantages of using these procedures are ADP cost reduction and ease of use. One drawback to tape data storage is that the file is not instantly available for editing at the terminal. In order to edit a file from the terminal, the file must be resident on a disk. In this case one of the procedures can be used to submit a job to copy the tape file back to a disk. For large infrequently-used files the cost of moving the file back and forth is much less than keeping the file on a disk all the time.

Unlike disk files, tape files are not backed up at COMNET since they are much less likely to be destroyed by system malfunctions. There are two possible solutions to this. One is to save the old version of the tape file, uncataloged but still accessible by any program and by the procedures described here. The old version and a copy of the changes would be sufficient to recreate the new version. The other possible solution is to use these procedures to create a back-up copy of the new version which would be saved on a separate volume.

Large infrequently used data files currently residing on disks at the EPA Washington Computer Center may be reliably maintained on tape volumes. Relatively inexperienced programmers may use the procedures outlined here to do this without a detailed understanding of tape usage. The placement of these files on magnetic tape results in reduced ADP costs.

REFERENCES

Brown, Gary DeWard, "System 370 Job Control Language," John Wiley & Sons, 1977.

"ALPHA User's Guide," Computer Network Corporation, 5185 MacArthur Boulevard, NW, Washington, D.C., 20016, 1977.

"OS/VS Utilities," IBM Corporation, Order No. GC35-005-3, 1974.